

Mr. Birt, on the Floor of Plato.

It is, of course, possible to ascertain beforehand whether the C ray is transmitted by the fluid, provided a suitable spectroscope is used; a trial showed that the red light transmitted by a solution of carmine in ammonia included the F ray, but this solution did not bring to view the luminous prominences. I am now preparing some pure carminic acid and some compounds of that acid for future experiments, and I am having a series of bottles made of larger capacity than those I have hitherto employed; for I have found that unless the light passes through one or two inches, or even more, of some of the coloured fluids, the eye is inconvenienced by the great brilliancy of the Sun's image. The vessels used have, of course, two sides of parallel glass.

On the Floor of Plato. By W. R. Birt.

During the last forty-eight years, occasional notices of the spots and marking on the floor of the walled plain *Plato* have appeared. In consequence of having given considerable attention to *Plato* and its surroundings in the years 1860 to 1863, I collected all the observations of the spots that I became acquainted with, numbering in the whole fifty-six, having reference to fourteen spots, two or three of which had been observed as craters, one being double. The greatest number observed *simultaneously* was seven, by Gruithuisen, in the year 1825. On the 23d of February of the present year, Mr. Pratt, of Brighton, observed with his 8-inch silvered-glass reflector eleven spots at the same time. They were not, however, eleven of the spots which had been observed previously, but included four unrecorded and a second double spot. Mr. Pratt has steadily continued his observations up to the present time, and determined the relative positions of twelve spots by alignment. Mr. Edward Crossley, of Halifax, has also kindly requested his assistant, Mr. Joseph Gledhill, to make continuous observations on them with his 9.3-inch achromatic by Cooke. The observations made by Mr. Gledhill and Mr. Pratt I have regularly received. The following are the names of the astronomers who have observed the floor of *Plato*. Gruithuisen, Mädler, Challis, Knott, the late Lord Rosse, the late Rev. W. R. Dawes, Baxendell, Dr. Dobie, Birt, Pratt, Crossley, Gledhill, and Elger, the number of observations being 297, in fifty series, and the number of spots observed twenty-five, including the companion of Dawes's double spot. In the annexed Table the number of each spot is given in accordance with the accompanying diagram, the name of the discoverer, the number of times each spot has been observed since the commencement of the present year, 1869, the comparative degree of visibility, that of the central spot, No. 1, being reckoned as unity, or 1.00, and remarks on the positions and general characters of the spots.

Spots on Plato.

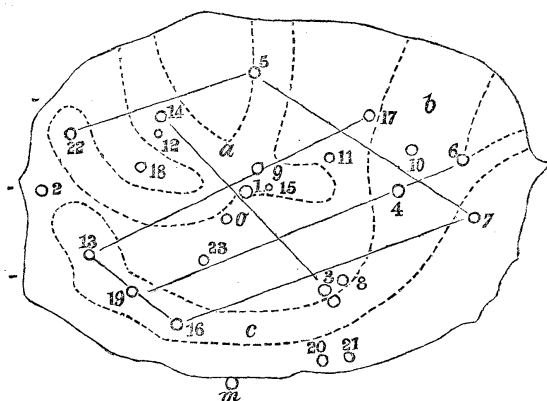
No.	Discovered by	Obs.	Visibility.	Remarks.
0	Gruithuisen			N.W. of 1, apparently nearer than 23.
1	Gruithuisen	32	1'000	Central, easy, generally of the same appearance.
2	Gruithuisen	1		Near the W. rim, seen once only by Gledhill.
3	Gruithuisen	23	·782	Dawes's double crater, frequently seen single.
4	Gruithuisen	27	·844	Departs often from typical state; seen double by Pratt.
5	Challis	20	·625	Not seen so frequently as 3.
6	Gruithuisen	8	·250	Seen lately by Pratt and Gledhill.
7	Gruithuisen	8	·250	Seen lately by Gledhill, Pratt, and Elger.
8	Gruithuisen			Probably the S.E. companion of 3.
9	Dobie	5	·156	A minute spot S.E. of 1, seen by Dawes and Gledhill.
10	Pratt	6	·187	Seen by Gledhill and Elger.
11		1		A minute spot between 9 and 17, seen once by Gledhill.
12	Gledhill	3	·094	N. of No. 14; seen only by Gledhill.
13	Pratt	17	·531	On curved streak c, now frequently seen.
14	Pratt	21	·656	On central arm of "trident," frequently seen.
15	Dawes	1		A minute spot due E. of 1, seen once by Gledhill.
16	Pratt	13	·406	On curved streak c, frequently seen.
17	Mädler	21	·656	On wedge of "sector," frequently visible.
18	Gledhill	1		Near N.W. arm of "trident," alignment 1 : 18 : 22.
19	Gledhill	17	·531	On curved streak c, frequently seen.
20	Knott	3	·094	Near N. border, probably seen by Gledhill.
21	Knott			E. of 20, near N. border.
22	Mädler	9	·281	Seen lately by Gledhill, Pratt, and Elger.
23	Pratt	1		Alignment 19 : 23 : 4.

As the comparative visibility of a spot depends upon its size and brightness, the larger and brighter spots are more likely to be seen in indifferent states of the Earth's atmosphere than those which are small and of less brilliancy. The number of observations, 238, between Feb. 23 and Sept. 27, 1869, afford a preliminary basis for an approximate measure of the degree of visibility of each according to the number of times it has been observed. The present order of visibility is as under :—

No.	Visibility.	No.	Visibility.	No.	Visibility.	No.	Visibility.
1	1'000	17	·656	16	·406	10	·187
4	·844	5	·625	22	·281	9	·156
3	·782	13	·531	6	·250	12	·094
14	·656	19	·531	7	·250	20	·094

C

In most cases the degree of visibility is underrated, as it is probable that in another series by the same observers many of the smaller spots may be *looked* for and *seen* under circumstances which, in earlier observations, occasioned them to have been overlooked, unless specially sought for. The spots remaining in the same condition, affected only by variations in the Earth's atmosphere, the probability is that successive series of about the same number of observations by the same observers will give similar degrees of visibility. It may be remarked that on no occasion have all the spots been seen simultaneously; the greatest number recorded in one watch is thirteen, and these were not all seen at once.



The dotted lines in the diagram are intended to represent the probable boundaries of the lighter markings on the floor of *Plato*, which are by no means of a sharp or definite character, but ill-defined and passing gradually into the darker hue. Although there is some reason to conclude that they are really permanent, yet they are seldom seen alike. The observations of these delicate markings are not at present sufficiently numerous to allow of an examination into the circumstances that affect their visibility. In conclusion, I would remark that this communication is intended rather as a contribution towards elucidating a confessedly difficult branch of Selenography, than establishing the order of visibility of the spots above named, further observations being required for this object.

Lunar Eclipse of 23rd and 24th July, 1869. By John Tebbutt, Jun.

The lunar eclipse of the 23-24th July was observed here as follows :—

						Windsor M.T.			
						d	h	m	s
First contact with shadow	..	..	..	..	..	23	10	43	35
Last	„	„	..	..	..	13	29	28	